

## CLAIMS

1. 1. A lithium battery powered LED light comprising:
  2. a lithium battery power source;
  3. a switch;
  4. a Gallium Nitride Light Emitting Diode (LED) selectively electrically connected to the lithium battery by the switch;
  5. a heat sink thermally coupled to the LED;
  6. a voltage converter and current regulator circuit having a circuit contact electrically connected to the switch, the LED and the lithium battery constructed and arranged to provide a predetermined voltage and current to the LED when connected to the lithium battery; and
  10. a housing within which the lithium battery, the switch, the LED, the heat sink and the voltage converter and current regulator circuit are located.
1. 2. A lithium battery powered LED light in accordance with claim 1 wherein the housing comprises a metal body comprising the heat sink.
1. 3. A lithium battery powered LED light in accordance with claim 1 wherein the housing includes a metal body having threaded parts comprising the switch, which is closed when the threaded parts of the housing are screwed together in a first direction, thereby urging the lithium battery against the circuit contact, causing activation of the voltage converter and current regulator circuit and causing the LED to emit light.
1. 4. A lithium battery powered LED light in accordance with claim 3 and further comprising,
  3. a compressed rubber ring configured to urge the battery away from the circuit contact and deactivate the voltage converter and current regulator circuit when the threaded parts of the housing are turned in a second direction opposed to the first direction.
1. 5. A lithium battery powered LED light in accordance with claim 3 wherein the threaded parts comprise outside-diameter threads and inside-diameter threads that are moveably coupled to each other.

- 1 6. A lithium battery powered LED light in accordance with claim 1 wherein the lithium
- 2 battery and the Gallium Nitride LED are constructed and arranged to have a shelf life of at
- 3 least 10 years.
- 1 7. A lithium battery powered LED light in accordance with claim 1 and further
- 2 comprising a collimator optically coupled to the LED.
- 1 8. A lithium battery powered LED light in accordance with claim 7 wherein the
- 2 collimator comprises an optical-grade-acrylic-plastic.
- 1 9. A lithium battery powered LED light in accordance with claim 7 wherein the
- 2 collimator is constructed and arranged to produce a substantially 10-degree light beam when
- 3 the LED is on.
- 1 10. A light in accordance with claim 7 wherein the collimator is integrally coupled to the
- 2 housing, thereby acting as a protective lens at a front end of the light to protect the LED and
- 3 electronic components included within the housing.
- 1 11. A lithium battery powered LED light in accordance with claim 1 wherein the LED is
- 2 constructed and arranged to emit light waves at a frequency that is seen by the human eye as
- 3 blue/green or teal in color.
- 1 12. A lithium battery powered LED light in accordance with claim 1 wherein the LED
- 2 has a brightness such that the LED can be seen from a distance of over 1 mile.
- 1 13. A lithium battery powered LED light in accordance with claim 1 wherein the voltage
- 2 converter and current regulator circuit is constructed and arranged to provide at least 85%
- 3 power efficiency.
- 1 14. A lithium battery powered LED light in accordance with claim 1 wherein the LED is
- 2 permanently mounted on a metal circuit board holder comprising,
- 3 a thermally conductive path thermally coupled to the LED and a metal body of the
- 4 housing.

1 15. A lithium battery powered LED light in accordance with claim 14 wherein the metal  
2 circuit board holder comprises a first passage, the lithium battery powered LED light further  
3 comprising:

4 a one-sided circuit board including a second passage aligned with the first  
5 passage;

6 a connecting wire passing through the first and second passages, the  
7 connecting wire electrically connected to the circuit board and to a contact for the lithium  
8 battery; and

9 a cavity defined by the housing within which portions of the connecting wire  
10 are stored.

1 16. A lithium battery powered LED light in accordance with claim 1 wherein the housing  
2 comprises polished metal in the form of a column.

1 17. A lithium battery powered LED light in accordance with claim 16 wherein the  
2 housing does not include any switches or buttons external to the housing.

1 18. A lithium battery powered LED light in accordance with claim 1 wherein the LED is  
2 electrically connected to an electronic circuit board that includes the voltage converter and  
3 current regulator circuit.

1 19. A lithium battery powered LED light in accordance with claim 18 wherein the  
2 electronic circuit board is a one-sided circuit board and the lithium battery is located on a  
3 side of the circuit board opposite of where the LED is located, the circuit board further  
4 comprising a passage

5 constructed and arranged to allow a wire connected to the LED to pass through the  
6 passage in the circuit board to a connection that is in contact with the battery.

1 20. A lithium battery powered LED light in accordance with claim 1 wherein the voltage  
2 converter and current regulator circuit is constructed and arranged to provide a minimum of  
3 2.7 volts to the Gallium Nitride LED.

- 1        21.    A lithium battery powered LED light in accordance with claim 1 wherein the Gallium
- 2        Nitride LED is a 1-watt LED and the Lithium battery is a 3-volt lithium battery, and wherein
- 3        the voltage converter and current regulator circuit is constructed and arranged to power the 1-
- 4        watt Gallium Nitride LED using the 3-volt lithium battery.
- 1        22.    A lithium battery powered LED light in accordance with claim 20 wherein the
- 2        voltage converter and current regulator circuit is constructed and arranged to allow the 3-volt
- 3        lithium battery to provide at least six hours of continual light from the 1-watt LED.
- 1        23.    A lithium battery powered LED light in accordance with claim 1 wherein the voltage
- 2        converter and current regulator circuit further comprises:
  - 3                an inductor electrically connected to the switch;
  - 4                a Schottky type diode including an anode side and a cathode side, the anode
  - 5                side electrically connected to the inductor;
  - 6                a current sensing resistor electrically connected to the LED;
  - 7                an output capacitor electrically connected to the cathode side of the Schottky
  - 8                type diode;
  - 9                a switching transistor electrically connected to the anode side of the Schottky
  - 10               type diode; and
  - 11               a voltage converter and current regulator controller IC including a voltage
  - 12               sense port electrically connected to the inductor, a current sensing port electrically connected
  - 13               to the current sensing resistor, and a transistor driving port electrically connected to the
  - 14               switching transistor.